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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/761,769

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William J. Parrish

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3528

7590

09/28/2005

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EXAMINER

ZETTL, MARY E

ART UNIT

PAPER NUMBER

2878

DATE MAILED: 09/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/761,769

Applicant(s)

PARRISH ET AL.

Examiner

Mary Zettl

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-37 is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-22 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 4, 5, and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>Jan 04 and Jul 05</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 recites the limitation "the plurality of switches" in lines 1-2 of the claim.

There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is suggested.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-3, 11, and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Marshall (US 6,515,285 B1).

Regarding claim 1, Marshall discloses a circuit (Figure 1A, item 108; col. 6, lines 15-17) comprising: a plurality of microbolometers forming a microbolometer array (col. 10, lines 24-26), wherein contacts (Figure 23, item 188) within the microbolometer array are shared among the microbolometers (Fig. 23; col. 30, lines 35-38); means for selecting from among the microbolometers in the microbolometer array (col. 30, lines

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43-46) and providing a corresponding output signal (col. 2, lines 32-34); and means for providing temperature compensation for the output signal (col. 9, lines 35-40).

Regarding claim 2, Marshall discloses the limitations set forth in claim 1 and further discloses a circuit (Figure 24; col. 30, lines 58-67) wherein the contacts (Figure 24, item 188) are shared between adjacent ones of the microbolometers in a column and the contacts are shared between the microbolometers in different columns in the microbolometer array.

Regarding claim 3, Marshall discloses the limitations set forth in claim 1, and further discloses a means for switching which provides for supplying a reference voltage to microbolometers (col. 2, lines 26-33) and producing a plurality of output signals from microbolometers (col. 2, lines 32-35).

Regarding claim 11, Marshall discloses the limitations set forth in claim 1 and further discloses a circuit comprising a data processor (FPA, focal plane array) adapted to provide uniformity-correction data for the plurality of microbolometers and to control non-uniformity corrections of the output signals (col. 10, lines 40-53).

Regarding claims 15-17, Marshall discloses the limitations set forth in claim 1 and further discloses a circuit, wherein the means for providing temperature compensation comprises at least one current source associated with the plurality of microbolometers (col. 14, lines 43-45); at least one bias circuit adapted to provide a bias for the plurality of microbolometers (col. 10, item 19-33); and further comprising a data processor (FPA, focal plane array) adapted to provide uniformity-correction data for the

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plurality of microbolometers and to control non-uniformity corrections of the output signals (col. 10, lines 40-53).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 12 –14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (US 6,515,285 B1) in view of Cannata et al. (US 5,811,808 A).

Regarding claims 12-14, Marshall discloses the limitations set forth in claim 11 and further discloses a data processor adapted to compensate for non-uniformities in the data (col. 10, lines 48-51), however Marshall does not disclose utilizing trim resistance values and offset values for this purpose. Cannata et al. teaches an infrared imaging system having a focal plane array, including a readout circuit and a means for correcting nonuniformities in the individual detector elements by storing offset correction values and using the store offset values to control correction circuitry (Abstract). Cannata et al. further specifies the uniformity-correction data comprising trim resistance values ( $V_D$ ) and offset values ( $V_{OC}$ ) (col. 13, lines 2-12) and additional fine offset values (col. 17, lines 7-8) and gain calibration values (col. 7, lines 1-5) for the plurality of

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microbolometers and at least one external resistor value ( $R_D$ ; col. 12, lines 16-20). At the time the invention was made, it would be obvious to one skilled in the art to modify Marshall such that a means for providing compensation for non-uniformities in the data as suggested by Cannata et al. was utilized. By providing compensation for non-uniformities more uniform data is provided and image quality is increased.

Regarding claim 18, Marshall discloses the limitations set forth in claim 17. Marshall does not disclose expressly uniformity-correction data comprising a current value for the current source and offset values for the plurality of microbolometers. Cannata et al. teaches uniformity-correction data comprising a current value ( $I_{bias}$ ; col. 12, lines 22-24) for the current source and offset values (provided by offset correction circuitry; col. 12, lines 60-64) for the plurality of microbolometers. It would be obvious to one of ordinary skill in the art to modify Marshall such that uniformity-correction data comprising a current value for the current source and offset values was utilized as suggested by Cannata et al. in order to produce more uniform data and higher quality images.

4. Claims 6-10, 19-22, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marshall (US 6,515,285 B1) in view of Parrish et al. (US 6,812,465 B2).

Regarding claims 6-10 Marshall discloses the limitations set forth in claim 1 and further discloses a circuit wherein the means for providing temperature compensation (temperature compensated integrated circuit; Figure 1C, item 2000; col. 9, line 12) comprises at least one resistor (Figure 1C; items 2004 and 2006) associated with the

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plurality of microbolometers and at least one reference path associated with at least one of the plurality of microbolometers, the reference path adapted to provide a reference voltage ( $V_{ref}$ ; Figure 1C; col. 9, lines 37-43). Marshall also discloses providing a bias current (col. 10, item 19-33). Marshall does not disclose expressly, a bias circuit comprising a load microbolometer and a resistor adapted to provide temperature coefficient of resistance compensation for the load microbolometer. Parrish et al. teaches a bias circuit comprising a load microbolometer (Figure 7A, item 36) and a resistor (Figure 7A, item 26) adapted to provide temperature coefficient of resistance compensation for the load microbolometer (col. 5 lines 66-67). At the time the invention was made, it would be obvious to one skilled in the art to take the invention of Marshall and modify it such that the bias current was produced through the bias circuit as described by Parrish et al. and such that a resistor also as described by Parrish et al. is provided for temperature coefficient of resistance compensation for the load microbolometer. One of ordinary skill in the art would be motivated to combine the teachings of Marshall and Parrish et al. since it is well known that resistors typically have a different temperature coefficient of resistance than microbolometers and a thus a needs for compensation is needed to ensure accurate measurement.

Regarding claims 19-22 and claims 24-26, Marshall teaches a method of providing calibrated output signals from a microbolometer focal plane array (col. 10, lines 24-26) having contacts shared between adjacent microbolometers in columns of the array and between microbolometers in different columns of the array (Fig. 23; col. 30, lines 35-38); the method comprising: selecting at least one row of the

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microbolometer focal plane array to provide corresponding output signals from microbolometers in the row (col. 12; 19-22); and providing an offset value to provide temperature compensation for at least one microbolometer in the row (col. 15, lines 46-49). Marshall further teaches that the means for selecting the row in the array comprises applying a reference voltage to the microbolometers in the row (col. 9, lines 28-30); and providing a signal path from the microbolometers in the row (col. 12, lines 19-26). Additionally Marshall teaches providing a fine offset, gain calibration (col. 15, lines 45-55) and an additional offset (coarse offset values; col. 15, lines 4-43) to the output signals. Marshall does not disclose expressly providing a trim resistor value to provide temperature compensation for at least one microbolometer in the row. Parrish et al. teaches microbolometer circuitry and methods in which the relative mismatch in the temperature coefficient of resistance of an active microbolometer and a reference microbolometer is compensated by employing a variable (trim) resistor in series with the active microbolometer (Abstract and col. 9, lines 7-10). At the time the invention was made it would be obvious to one of ordinary skill in the art to take the invention of Marshall and incorporate the temperature compensation method of Parrish et al. in order to provide an additional method for reducing non-uniform behavior.

***Allowable Subject Matter***

5. Claims 27-37 are allowable.

The following is an examiner's statement of reasons for allowance:



Prior art fails to teach or make obvious a first and second plurality of switches that are initially asserted and deasserted, respectively, with one of the switches from the first plurality deasserted prior to one of the switches from the second plurality being asserted which couple to the same contact, with this switching pattern repeated for the first and second plurality of switches until the second plurality of switches are all asserted.

6. Claims 4, 5, and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance:

Regarding claim 4, prior art fails to teach or make obvious a first and second plurality of switches that are initially asserted and deasserted, respectively, with one of the switches from the first plurality deasserted prior to one of the switches from the second plurality being asserted which couple to the same contact, with this switching pattern repeated for the first and second plurality of switches until the second plurality of switches are all asserted.

Regarding claim 5, prior art fails to teach or make obvious a circuit wherein one of the first set of switches is asserted for every two of the second set of switches to provide the output signal for two of the microbolometers in corresponding columns.

Regarding claim 23, prior art (Marshall US 6,515,285 B1) teaches applying a reference voltage to the microbolometers in the array (col. 9, lines 28-30) and selecting sequentially each row of the microbolometer array (Backer et al., page 84, paragraph 2)

however prior art fails to teach or make obvious removing the reference voltage from the previous row prior to selecting the next row through the shared contacts.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary Zettl whose telephone number is (571) 272-6007. The examiner can normally be reached on M-F 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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